

grading forms. For this reason the taxonomic status of the type subspecies shall for the present represent both Hawaiian shell populations, from Maui and from Keehi Lagoon, Oahu.

It is important to have the measurements of known specimens a matter of record. However, it is impossible to set a size criterion for Cypraea cernica marielae, as the size distribution of the paratypes and hypotypes is significantly variable. An average of these variations seems only to develop confusion. The value of the species does not depend so much on its shell size as it does on its structure, the treatment of its speciation through isolation, and its subsequent morphological evolution based upon local ecological influences. C. cernica marielae adequately displays the taxonomic characters of isolation and morphological change to warrant its recognition as a new subspecies.

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The Subfamily Drupinae (Gastropoda) in the Eastern Pacific

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The living members of the Drupinae are essentially inhabitants of shallow tropical Indo-Pacific waters, often occurring on coral reefs.

The genus Drupa Röding in Bolten, 1798, type (designated by Rovert, 1899), Drupa morum Röding in Bolten [= Murex neritoides Gmelin, 1791, p. 3537 (not Gmelin, p. 3559; not Linnaeus, 1767) = Ricinula horrida Lamarck, 1816 = Ricinella violacea Schumacher, 1817], includes low spired, spiny shells, the columella plicated or wrinkled. The interior of the outer lip bears strong denticles or plications which are arranged in groups of twos or threes, Sistrum Montfort, 1810, type Sistrum album Montfort

[= Murex ricinus Linnaeus], is relegated to the synonymy of Drupa.

Morula Schumacher, 1817, type, Morula papillosa Schumacher [= Drupa uva Röding in Bolten], includes biconic shells which are generally smaller than Drupa and are nodosely sculptured. The denticles inside the outer lip are not grouped. This genus is represented in the Recent fauna of the eastern Pacific on the outermost islands from which two forms have been reported, Morula uva Röding in Bolten and M. uva aspera Lamarck. Two species, with elongated shells, which occur along the mainland of the eastern Pacific have been referred by some authors to Morula. These were des-

cribed as Ricinula ferruginea Reeve and Buccinum lugubre C. B. Adams. The latter one ranges north to southern California.

Drupa is represented in the Recent fauna of the eastern Pacific only at islands far offshore (Galapagos Islands and Clipperton Island). Two species have been reported, Drupa morum Rødding in Bolten, D. ricina Linnaeus and D. ricina form albolabris Blainville.

Fossil forms referred to "Ricinula" or "Sistrum" have been reported from Europe and the East Indies, from beds of Paleocene or Eocene age, but I have not seen specimens. An illustration of one Eocene species, "Ricinula (Sistrum) ringens" Deshayes does not closely resemble typical Drupa or Morula. So far as has been ascertained from a perusal of the literature, typical Drupa occurs from Pliocene to Recent.

No species has been recorded under the genus name Drupa or Ricinula among the hundreds of fossil forms described from the western Americas. However, one species from beds of Pliocene age at Coos Bay, Oregon, was described as Sistrum hannai by Howe (1922, p. 102, pl. 8, figs. 1, 5). This interesting species has been found in beds of similar age in San Benito County, California (NW-1/4, Sec. 26, T. 19S., R. 11E., M. D.B. & M.). The type specimen is a very thick, subglobose shell 66 mm. high and 53.4 mm. in diameter, with a moderately elevated spire, the exterior sculptured with subdued spiral threads which alternate in size. The interior of the outer lip bears a thick elongated node surmounted by two closely arranged denticles. No plications are observable on the columella. The shell has experienced some erosion, but there is no evidence that the columella was ever other than smooth.

The only Recent species of Drupa bearing a general resemblance to this form is Drupa iodostoma Lesson (Ricinula iodostoma Lesson, Rev. Zool., Cuvierienne, p. 355, 1840; Guérin's Mag. de Zool., Moll., pl. 58, 1842). Compared to D. iodostoma, the fos-

sil form is much larger and thicker, has a high spire, a thick outer lip, and a smooth columella. These differences are so pronounced that a new supraspecific unit may need to be proposed for "Sistrum" hannai.

In summary, the subfamily Drupinae is known to be represented in the waters of the eastern Pacific by two genera, occurring on the outer fringe of islands, and by two species referred to Morula occurring along the west American mainland. One species, referable to this subfamily but not typical of Drupa or Morula occurs in beds of middle Pliocene age in Oregon and California.

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